United States Patent [19]

Feneberg et al.

[11] **4,055,378**

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[54] **SILICONE CONTACT LENS WITH HYDROPHILIC SURFACE TREATMENT**

[75] Inventors: **Paul Feneberg**, Planegg; **Ulrich Krekeler**, Munich, both of Germany

[73] Assignee: **Agfa-Gevaert Aktiengesellschaft**, Leverkusen, Germany

[*] Notice: The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

[21] Appl. No.: **566,603**

[22] Filed: **Apr. 10, 1975**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 517,096, Oct. 22, 1974, Pat. No. 3,959,105, which is a continuation-in-part of Ser. No. 318,853, Dec. 27, 1972, abandoned.

[30] **Foreign Application Priority Data**

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Oct. 25, 1973	Germany	2353495
Apr. 11, 1975	Germany	2417660

[51] **Int. Cl.**[2] **G02C 7/04**

[52] **U.S. Cl.** **351/160;** 204/165; 351/177

[58] **Field of Search** 351/160, 177; 204/164, 204/165

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,228,741	1/1966	Becker	351/160
3,431,046	3/1969	Conrad et al.	351/160
3,542,461	11/1970	Girard et al.	351/160
3,925,178	12/1975	Gesser et al.	351/160 X
3,959,105	5/1976	Feneberg et al.	351/160 X

Primary Examiner—David H. Rubin

Attorney, Agent, or Firm—Michael J. Striker

[57] **ABSTRACT**

A contact lens has a concave surface which is adapted to contact the cornea of an eye and a convex surface which is adapted to contact the eyelid. At least the convex surface of the lens possesses hydrophilic characteristics although the concave surface of the lens preferably possesses such characteristics also. In any event, the convex surface of the lens has a greater wettability than the concave surface thereof. The more highly hydrophilic character of the convex surface prevents the deposition thereon of fatty substances carried by the tear fluid which may cause opacity of the lens. The less highly hydrophilic character of the concave surface decreases the forces responsible for maintaining the lens in position in the eye, although not to such an extent that the lens does not remain properly positioned. These forces have been found to be a source of irritation in that they produce the feeling of a foreign body in the eye and the decrease in these forces occasioned by the less highly hydrophilic character of the concave surface of the lens enables this feeling to be eliminated. The concave surface of the lens need not be as highly hydrophilic as the convex surface thereof since the quantity of tear fluid which comes into contact with the concave surface is considerably less than that which comes into contact with the convex surface. The maximum contact angle for the convex surface of the lens, as measured with distilled water, should be about 65°. The surfaces of the lens may be made hydrophilic by chemical means or by bombardment with charged particles.

24 Claims, 1 Drawing Figure